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SUBJECT: BULGARIA'S UNTAPPED RENEWABLE ENERGY SOURCES

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11. SUMMARY: Bulgaria's alternative and renewable energy sources hold great potential, but most will go unrealized for the foreseeable future due to a lack of financial and manpower resources and a comprehensive national plan. Diversification of the energy sector is nonexistent. In 2004, 96 percent of Bulgaria's primary energy supply came from fossil fuels (mainly coal) and nuclear energy. Today, approximately 60-70 percent of Bulgaria's energy is imported, primarily from Russia. The share of electricity produced by renewable energy sources (RES) fluctuates between 4 and 11 percent. In 2005, RES contributed 10.8 percent of the country's total electricity produced in comparison with only 4.5 percent in 2004, primarily due to an abundance of rain overflowing local river systems and fueling the country's hydroelectric power plants. Experts estimate that the Bulgarian economy has the potential to produce 755 million kWh of hydropower, 30.65 million kWh of energy from biomass, and 440,000 kWh of geothermal energy. However, Bulgaria must further develop and diversify its RES if it is to begin to alleviate the country's overwhelming dependence on Russian energy imports. END SUMMARY

Hydroelectric Possibilities are Flowing

12. Bulgaria's greatest potential for renewable energy generation, as well as investment opportunities, lies in its hydroelectric sources. In 2005, hydroelectric power plants (HPPs) were responsible for more than 96 percent of renewable energy production. Although the larger HPPs logically generate the majority of electrical power, many of them are over thirty years old and must be updated in order to restore their peak capacities. The Government of Bulgaria (GoB), in an effort to limit dependence on foreign fuel imports, is modernizing many of the larger HPPs. Approximately sixty-three small and micro HPPs are located on the National Energy Company's (NEK) property and all are targets for privatization initiatives in the future. The GoB has also initiated new licensing methods to encourage the development of HPPs and associated projects. Although the investment required to build a small hydroelectric power plant is between USD 8,000 and USD 1.25 million depending on the plant's capacity, the great investor interest in constructing and operating these plants is due to the guaranteed market opportunity; under Bulgarian law, the NEK must buy all the energy produced by HPPs at preferential prices.

Biomass Gaining Ground

¶3. Biomass may also serve as a good renewable energy source in Bulgaria. Officials from the Ministry of Economy and Energy report that biomass officially accounts for 3.7 percent of Bulgaria's renewable energy production; however, they tell us that in reality the percentage is much higher since most of it is done in rural areas and is difficult to track and measure. In late September 2006, the Ministry of Economy and Energy will present a comprehensive plan for the development of biomass and biomass technologies. Although initial steps have appeared promising, a lack of project funding has hindered further progress. We have heard of at least two American companies interested in investing in biomass facilities.

Wind Technologies Picking Up Speed

¶4. Development of wind energy projects in Bulgaria holds some promise as both the U.S. Trade and Development Agency (USTDA) and USAID are funding feasibility studies for wind generation. However, currently there are no operational industrial-sized wind energy power plants and only ten small wind parks in the entire country. Similar to hydroelectric power, current Bulgarian legislation requires that the NEK buy all wind-produced electric energy at a preferential price. In addition, there are many favorable financing methods for the creation and operation of wind parks. For example, there is a credit line of 20,000 to 1.5 million Euros with a 20 percent grant from the European Bank of Reconstruction and Development to finance wind power projects. Through the Kyoto Protocol, Bulgaria has contracts for grant financing of wind power projects with the governments of Holland, Austria, and Switzerland. Available wind resource data indicates that there are areas throughout Bulgaria with sufficiently strong winds to

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generate power economically. The highest wind resource regions are located along the northern Black Sea coast, the central mountain range, and the Rhodope Mountains in the southwest.

¶5. Progress is being made in the construction of Bulgaria's first industrial-size wind park. Forty-four wind generators with an estimated combined force of over 100 megawatts are being built on Mount Murgash in the Balkan Range by the Bulgarian firm "Eco-Source Energy." The project is underway, and the first twenty generators are slated to be active by the end of the 2006. The entire project is estimated to be worth near USD 110 million. However, the project is currently awaiting an environmental impact evaluation by the Ministry of the Environment, which may take anywhere from several months to a year to complete.

¶6. USAID/Sofia, working with EnCon Services International, General Electric and the Utility Wind Interest Group is also implementing a two year project to develop and operate a 5-10 MW pilot wind farm in partnership with a local government and local energy services company. The project structure requires the establishment of a public-private partnership with a municipality and private energy services company that will be responsible for operation and maintenance of the wind farm. The municipal leasing approach is designed to overcome many of the financial obstacles that currently impede private power projects, and should help provide a needed source of revenue to cash-strapped municipal governments.

¶7. Several foreign firms are also awaiting licenses for potential projects along the northern Black Sea coast to develop wind technologies. "Bulgarian Wind Plants," a subsidiary of the French "Electricit de France," has plans to construct a wind park in Kavarna. The Japanese firm "Mitsui" also has plans to construct a wind electrical plant

in Burgas. Despite growing investor interest, several ecological and bureaucratic challenges remain. For example, wind parks pose a danger to migrating birds. Mitsui's 12 million Euro project near the city of Burgas has been temporarily frozen due to arguments with environmental groups. From a bureaucratic standpoint, many administrative obstacles such as excessive licensing and formal documentation requirements nullify any favorable and preferential financing given to investors.

Geothermal Possibilities are Untapped

¶8. Bulgaria has a sizable reserve of geothermal energy which has gone untapped and unexplored. According to Kostadinka Todorova, the Director of the State Energy Efficiency and Environmental Protection Directorate, the country is positioned on top of "a large geothermal sea" and only utilizes a small percentage of its potential. Although there are no active geothermal energy production sites in Bulgaria, there are a number of state organizations that have performed research into the exploitation of this resource. All activities regarding the use of geothermal reservoirs for energy purposes are channeled through governmental agencies such as the Ministry of Energy (ME), State Energy Regulatory Commission (SERC), State Energy Efficiency Agency (SEEA), and the Ministry of Environment and Waters. Recent legislative reorganizations have also led to the possibility of foreign investment to develop geothermal sites. Similarly, the World Bank is financing a project for the development of heating utilities at eight geothermal sites.

Solar Prospects are not Bright

¶9. The prospects for solar energy generation in Bulgaria are minimal, since only a relatively small portion of its terrain receives sufficient levels of solar radiation. The opportunities for solar technologies are greatest for low temperature thermal applications, such as solar thermal systems for residential, public and agricultural use, hot water passive solar systems for heating, and systems for drying wood material and agricultural products. However, the GoB's Energy Efficiency and Environmental Protection Directorate would like to develop solar energy beyond household application. But all parties agree that due to the high cost of solar technology, with the exception of a few experimental and prototype photovoltaic projects, the

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prospects for further exploitation are not very bright.

¶10. COMMENT: The Ministry of Economy and Energy and the Energy Efficiency and Environmental Protection Directorate are working on legislation that will provide a comprehensive strategy and plan for developing Bulgaria's renewable energy sources. A secondary objective is to provide future investors with additional concessions and incentives to exploit these largely underutilized energy resources. Although the GoB currently lacks a comprehensive national plan, officials told us that Bulgaria is working to achieve 11 percent of its total energy production from RES by 2010, with an eventual target of 40 percent sometime in the future. Although Bulgaria clearly recognizes its over-reliance on foreign energy imports, it does not yet have the financial resources to adequately exploit its RES potential. In a country faced with competing economic priorities, RES has not yet made it into the top tier. Nevertheless, opportunities abound for U.S. investors entering the energy efficiency and RES sectors market early.

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